

REMARKS:

Claims 5-9 are in the case and presented for consideration.

The examiner has rejected claims 5-8 under 35 U.S.C. 103(a) as obvious from Japanese Patent JP 05019240 to Masayuki (JP '240) in view of U.S. Patent 5,496,497 to Takiguchi. Specifically, the examiner argues that although JP '240 fails to teach an ethoxylated alkyl-phenolacrylate that is readily miscible with a liquid crystal material, Takiguchi '497 teaches an alkyl-phenol acrylate that is either readily miscible or poorly miscible with the liquid crystal material.

Applicant respectfully reiterates that the examiner has interpreted the teaching of Takiguchi '497 out of context to reconstruct the invention from prior art. It is well-accepted law that hindsight may not be applied when combining references, and that the references themselves must teach or suggest the combination.

When prior art references require a selective combination to render obvious a subsequent invention, there must be some reason for the combination other than the hindsight gleaned from the invention itself. Something in the prior art as a whole must suggest the desirability, and thus the obviousness, of making the combination.

Uniroyal Inc. v. Rudkin-wiley Corp., 837 F.2d 1044, 5 USPQ2d 1434 (Fed. Cir. 1988).

Takiguchi '497 does not teach or suggest an alkyl-phenol acrylate that is either readily miscible or poorly miscible with a liquid crystal material. In fact, Takiguchi '497 does not teach or suggest that any specific monomer is readily miscible or poorly miscible with any liquid crystal. Takiguchi '497 is only concerned with a combination of monofunctional and bifunctional monomer components, wherein a specific range of HLB values for the components result in particular light dispersion properties. (col. 4, lines 42-64).

Although the monofunctional acrylate component can be a mixture of

monofunctional acrylates, Takiguchi '497 is not concerned with the miscibility of either monofunctional acrylate, but only that the final HLB value of the resultant monofunctional acrylate component be within the range of 2.5 to 7.0. Hypothetically, both monofunctional acrylates of the monofunctional acrylate component can be readily miscible at the same time or poorly miscible at the same time with a liquid crystal material, so long as the final monofunctional acrylate component has an HLB value in the range of 2.5 to 7.0. However, this would be contrary to the applicant's claimed mixture recited in claim 5 as containing "two types of non-volatile reactive monomers, the first type of monomer being alkoxyated and readily miscible with a liquid crystalline material and the second type of monomer being poorly miscible with said liquid crystalline material."

It is well known in the art of colloidal chemistry that compounds having an HLB value between 1 and 10 are predominantly lipophilic whereas HLB values greater than 10 indicate a predominance of hydrophilicity. Therefore, monomers (5) and (6) of the '497 patent are both predominantly lipophilic and therefore, both could be incompatible with a very polar liquid crystal material even though monomer (6) is less lipophilic than monomer (5). Likewise, both monomers could be compatible with a very non-polar liquid crystal material. The 4.2 difference in HLB value may not be as significant as the examiner purports for purposes of miscibility since it is not clear what the polarity of the liquid crystal is in the Takiguchi '497 patent.

On page 7 of the Official Action, the examiner evades the above argument in paragraph 11 by stating that "JP '240 is the primary reference that teaches a mixture of one acrylate miscible with the liquid crystal and one poorly miscible with the liquid crystal." It is believed that the examiner has failed to consider the fact that JP '240 fails

to teach an ethoxylated alkyl-phenolacrylate that is readily miscible with a liquid crystal material. Since the '497 patent only provides HLB values for a variety of monomers without any indication as to the miscibility of the substances in any particular liquid crystal, and JP '240 fails to teach an ethoxylated alkyl-phenolacrylate that is readily miscible with a liquid crystal material, independent claim 5 is non-obvious and patentable. Accordingly, dependent claims 6-8 are believed to be non-obvious and patentable for at least the same reasons.

As the examiner is no doubt aware, all limitations of a claim must be considered meaningful, and, "the PTO must consider all claim limitations when determining patentability of an invention over the prior art." *In re Lowry*, 32 USPQ2d 1031, 1034 (Fed. Cir. 1994). Despite the examiner's reliance on monomers (5), (6), (7), and (8), the '497 patent still fails to teach or suggest a mixture that "contains two types of non-volatile reactive monomers, the first type of monomer being alkoxylated and readily miscible with a liquid crystalline material and the second type of monomer being poorly miscible with said liquid crystalline material," as recited in independent claim 5. Applicant has clearly set forth a particular combination of elements that is not shown or suggested by the prior art.

The examiner refers to the acrylate monomer (6) as a specific member of the family of acrylate monomers (7). The examiner then states that the ethoxylated alkyl-phenolacrylate family of acrylate monomers of formula (8) is listed as being a suitable one like (7). The examiner also states that a specific ethoxylated alkyl-phenolacrylate M4 is 5.2 which is less than monomer (5). However, Takiguchi '497 fails to teach or suggest the miscibility of ethoxylated alkyl-phenolacrylate. The '497 patent only teaches monomers with HLB values.

The examiner further states that the difference in HLB between monomer (5) and monomer (6) defines one monomer being miscible and the other being poorly miscible depending upon whether the liquid crystal is hydrophilic or lipophilic. As stated above, it is well known in the art of colloidal chemistry that compounds having an HLB value between 1 and 10 are predominantly lipophilic whereas HLB values greater than 10 indicate a predominance of hydrophilicity. Therefore, monomers (5) and (6) of the '497 patent are both predominantly lipophilic and therefore, both could be compatible or incompatible depending on the nature of the liquid crystal material.

Also, the examiner's logic appears to be that if one assumes that monomer (6) is readily miscible based on the nature of the liquid crystal, then formula (8) is also readily miscible since monomer (6) is a specific member of the family of acrylate monomers (7), and formula (8) is listed as being a suitable one like (7). However, the '497 patent clearly states at col. 6, lines 46-49, that "formulas (7) and (8) are preferred when used in combination because they can be obtained and synthesized with no difficulty and the vapor pressure of each monofunctional acrylate is low." Therefore, the reasons that formula (8) is like (7) are not related to miscibility. Also, the preference of combining formulas (7) and (8) by the examiner's reasoning would teach away from the claimed invention since formulas (7) and (8) would both be readily miscible in a preferred combination.

Moreover, the examiner's reliance on monomers (5), (6), (7), and (8) as part of the basis for rejection is also misplaced because all of these monomers are part of a mixture or combination resulting in a single monofunctional acrylate component that is readily miscible or poorly miscible based on its resultant HLB value. Takiguchi '497 clearly states at col. 6, lines 46-47, that "formulas (7) and (8) are preferred when used

in combination," wherein formula (8) is an alkyl-phenol acrylate. The '497 patent only teaches an alkyl-phenol acrylate that is part of a monofunctional acrylate component mixture which also includes a monomer of formula (7). The '497 patent does not teach or suggest use of an alkyl-phenol acrylate alone as a readily miscible component of a PDLC.

Accordingly, independent claim 5 and dependent claims 6-8 are believed to be non-obvious and patentable.

Finally, claim 9 has been rewritten and now recites the limitation of a "first type of monomer being alkoxyated and readily miscible." Therefore, independent claim 9 is believed to be non-obvious and patentable for the same reasons as stated above regarding Independent claim 5.

In summary, JP '240 fails to teach or suggest the limitation of a "first type of monomer being alkoxyated and readily miscible," as recited in independent claims 5 and 9. Likewise, Takiguchi '497 also does not teach or suggest the limitation of a "first type of monomer being alkoxyated and readily miscible." The examiner has attempted to introduce broad assumptions as to the effect of hydrophilic or lipophilic liquid crystal material on the monomers taught in Takiguchi '497, to show that certain monomers with certain HLB values would be readily miscible or poorly miscible depending on the nature of the liquid crystal material. These assumptions are not taught or suggested in Takiguchi '497. Therefore, the examiner has made the assumptions based on knowledge he receives from applicant's disclosure rather than from some suggestion in the Takiguchi '497 reference itself.


Accordingly, the application and claims are believed to be in condition for allowance, and favorable action is respectfully requested. No new matter has been

added.

If any issues remain which may be resolved by telephonic communication, the Examiner is respectfully invited to contact the undersigned at the number below, if such will advance the application to allowance.

Favorable action is respectfully requested.

Respectfully submitted,


Yan Glickberg
Reg. No. 51,742
Agent for Applicants
(845) 359-7700

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NOTARO & MICHALOS P.C.
100 Dutch Hill Road, Suite 110
Orangeburg, New York 10962-2100

Customer No. 21706

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